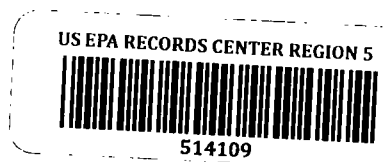


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ANALYSIS OF TRACE PAH IN WATER SAMPLES
FROM THE CITY OF ST. LOUIS PARK, MN
GAC TREATMENT PLANT
SAMPLE SET NO. 8

ERT PROJECT NO. D209-143
October, 1986
Revised March, 1987

PREPARED FOR

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ANALYSIS OF TRACE PAH IN WATER SAMPLES
FROM THE CITY OF ST. LOUIS PARK, MN
GAC TREATMENT PLANT

INTRODUCTION

This report represents the results of analysis conducted on various water samples (sample set No. 8) received by the ERT Analytical Chemistry Laboratory on October 8, 1986. The samples were to be analyzed for selected polyaromatic hydrocarbons (PAH) and heterocycles.

SAMPLE RECEIPT AND CHAIN OF CUSTODY

Routine inspection of the samples revealed them to be packaged properly and received in good condition.

Upon receipt, information from the submitted samples was recorded in the Master Log Book (and the LIMS computer system) and assigned ERT Control Numbers. These unique sample labels were affixed to respective sample containers and subsequently utilized throughout the laboratory analysis procedures for positive traceability.

ANALYTICAL PROCEDURES

The water samples were analyzed according to procedures as outlined in ERT Standard Analytical Method (SAM) #020-6 "Analytical Method for Low-level PAH and Heterocycles in Water", as provided in the Quality Assurance Project Plan for Sampling and Analysis - GAC Plant Testing, June - August, 1986, ERT Document No. P-D209-129-1, July, 1986.

QUALITY CONTROL PROCEDURES

Quality control procedures as described in the Quality Assurance Project Plan for Sampling and Analysis - GAC Plant Testing, June - August, 1986, ERT Document No. P-D209-129-1, July, 1986 were implemented for all analyses. Laboratory method (reagent) blanks, laboratory solvent blanks, laboratory duplicated samples, and laboratory method spike (fortified control) samples were analyzed concurrently with the submitted samples based on the following frequency:

- a) Laboratory method blank, 5% - one for every (20) samples submitted.
- b) Laboratory solvent blank, 10% - one for every (10) sample submitted.
- c) Laboratory method spikes, 5% - one for every (20) samples submitted.

All samples and quality control samples were fortified prior to extraction with selected deuterated PAH surrogate compounds, i.e., naphthalene-d⁸, fluorene-d¹⁰, and chrysene-d¹², at a sample concentration level of approximately 10 ng/1 (ppt). The following criteria, based on percent recovery, was to be utilized for the determination of data validity for each sample:

<u>Surrogate</u>	<u>Minimum Mean (%)</u>	<u>Mean (%)</u>	<u>Standard Deviation (%)</u>	<u>95% Confidence Limits</u>
Naphthalene-d ⁸	42	72	15	42
Fluorene-d ¹⁰	60	94	17	60
Chrysene-d ¹²	20	30	12	10

Various corrective action steps, as described in the QA plan, were to be initiated whenever the recovery of any one surrogate is found to be below the 95% confidence limit.

RESULTS OF ANALYSIS

The sampling report, analytical results report, the method spike recovery report, and the surrogate recovery report, are presented in the attached tables.

DISCUSSION

It should be noted that the analytical results for the method spike recovery samples for the eight (8) selected compounds were found to be within the method spike criteria for data validity, except for Indene which was 14% (rather than 20%). However, the average recovery for the target compounds was 35%, within the 20% - 150% target range.

A review of the surrogate recoveries indicated that one of the submitted samples below the lower 95% confidence limit as stated in the QA plan. Naphthalene-d⁸ surrogate recoveries are calculated from the reanalysis data generated on October 25, 1986. Quantitation of naphthalene-d⁸ was performed using the summation of Masses 136, 135, and 134 which correspond respectively to Naphthalene-d⁸, -d⁷, and -d⁶. This change methodology is necessary because ERT suspects that naphthalene-d⁸ undergoes degradation by replacing one or two deuterium atoms with hydrogen atoms.

ERT ANALYTICAL LABORATORY

SAMPLING REPORT

CITY OF ST. LOUIS PARK, MN

ppt PAH ANALYSIS IN WATER

ERT ANALYTICAL LABORATORY
SAMPLING REPORT
POLYAROMATIC HYDROCARBONS

1. FIELD IDENTIFICATION:	F-08
2. ERT SAMPLE NUMBER:	38841
3. FIELD LOGBOOK/PAGE NUMBER	NA
4. SAMPLING DATE:	10/07/86
5. DATE RECEIVED:	10/08/86
6. DATE EXTRACTED:	10/10/86
7. DATE ANALYZED:	10/15/86
8. GC/MS FILE #:	38841AD
9. GC/MS TAPE #:	MSD1
10. CORRESPONDING DFTPP FILE #:	DFTPP25
11. CORRESPONDING MATRIX SPIKE SAMPLE:	ERT# 38845
12. CORRESPONDING METHOD BLANK SAMPLE:	ERT# 39044
13. CORRESPONDING SOLVENT BLANK SAMPLE:	ERT# 39045
14. CORRESPONDING GC/MS CALIBRATION FILE #:	STD 38
15. COMMENTS: NA = NOT AVAILABLE	

ERT ANALYTICAL LABORATORY
SAMPLING REPORT
POLYAROMATIC HYDROCARBONS

1. FIELD IDENTIFICATION:	T-08
2. ERT SAMPLE NUMBER:	38842
3. FIELD LOGBOOK/PAGE NUMBER	NA
4. SAMPLING DATE:	10/07/86
5. DATE RECEIVED:	10/08/86
6. DATE EXTRACTED:	10/10/86
7. DATE ANALYZED:	10/14/86
8. GC/MS FILE #:	38842A
9. GC/MS TAPE #:	MSD1
10. CORRESPONDING DFTPP FILE #:	DFTPP24
11. CORRESPONDING MATRIX SPIKE SAMPLE:	ERT# 38845
12. CORRESPONDING METHOD BLANK SAMPLE:	ERT# 39044
13. CORRESPONDING SOLVENT BLANK SAMPLE:	ERT# 39045
14. CORRESPONDING GC/MS CALIBRATION FILE #:	STD 37
15. COMMENTS: NA = NOT AVAILABLE	

ERT ANALYTICAL LABORATORY
SAMPLING REPORT
POLYAROMATIC HYDROCARBONS

1. FIELD IDENTIFICATION:	TD-08
2. ERT SAMPLE NUMBER:	38843
3. FIELD LOGBOOK/PAGE NUMBER	NA
4. SAMPLING DATE:	10/07/86
5. DATE RECEIVED:	10/08/86
6. DATE EXTRACTED:	10/10/86
7. DATE ANALYZED:	10/14/86
8. GC/MS FILE #:	38843A
9. GC/MS TAPE #:	MSD1
10. CORRESPONDING DFTPP FILE #:	DFTPP24
11. CORRESPONDING MATRIX SPIKE SAMPLE:	ERT# 38845
12. CORRESPONDING METHOD BLANK SAMPLE:	ERT# 39044
13. CORRESPONDING SOLVENT BLANK SAMPLE:	ERT# 39045
14. CORRESPONDING GC/MS CALIBRATION FILE #:	STD 37
15. COMMENTS:	NA = NOT AVAILABLE

ERT ANALYTICAL LABORATORY
SAMPLING REPORT
POLYAROMATIC HYDROCARBONS

1. FIELD INDENTIFICATION:	TD-08A
2. ERT SAMPLE NUMBER:	38844
3. FIELD LOGBOOK/PAGE NUMBER	NA
4. SAMPLING DATE:	10/07/86
5. DATE RECEIVED:	10/08/86
6. DATE EXTRACTED:	10/10/86
7. DATE ANALYZED:	10/15/86
8. GC/MS FILE #:	38844A
9. GC/MS TAPE #:	MSD1
10. CORRESPONDING DFTPP FILE #:	DFTPP25
11. CORRESPONDING MATRIX SPIKE SAMPLE:	ERT# 38845
12. CORRESPONDING METHOD BLANK SAMPLE:	ERT# 39044
13. CORRESPONDING SOLVENT BLANK SAMPLE:	ERT# 39045
14. CORRESPONDING GC/MS CALIBRATION FILE #:	STD 38
15. COMMENTS: NA = NOT AVAILABLE	

ERT ANALYTICAL LABORATORY
SAMPLING REPORT
POLYAROMATIC HYDROCARBONS

1. FIELD IDENTIFICATION:	MS-08
2. ERT SAMPLE NUMBER:	38845
3. FIELD LOGBOOK/PAGE NUMBER	NA
4. SAMPLING DATE:	10/07/86
5. DATE RECEIVED:	10/08/86
6. DATE EXTRACTED:	10/10/86
7. DATE ANALYZED:	10/14/86
8. GC/MS FILE #:	38845A
9. GC/MS TAPE #:	MSD1
10. CORRESPONDING DFTPP FILE #:	DFTPP24
11. CORRESPONDING MATRIX SPIKE SAMPLE:	ERT# 38845
12. CORRESPONDING METHOD BLANK SAMPLE:	ERT# 39044
13. CORRESPONDING SOLVENT BLANK SAMPLE:	ERT# 39045
14. CORRESPONDING GC/MS CALIBRATION FILE #:	STD 37
15. COMMENTS:	NA = NOT AVAILABLE

ERT ANALYTICAL LABORATORY
SAMPLING REPORT
POLYAROMATIC HYDROCARBONS

1. FIELD IDENTIFICATION:	DI H2O
2. ERT SAMPLE NUMBER:	38846
3. FIELD LOGBOOK/PAGE NUMBER	NA
4. SAMPLING DATE:	10/06/86
5. DATE RECEIVED:	10/08/86
6. DATE EXTRACTED:	10/10/86
7. DATE ANALYZED:	10/15/86
8. GC/MS FILE #:	38846A
9. GC/MS TAPE #:	MSD1
10. CORRESPONDING DFTPP FILE #:	DFTPP25
11. CORRESPONDING MATRIX SPIKE SAMPLE:	ERT# 38845
12. CORRESPONDING METHOD BLANK SAMPLE:	ERT# 39044
13. CORRESPONDING SOLVENT BLANK SAMPLE:	ERT# 39045
14. CORRESPONDING GC/MS CALIBRATION FILE #:	STD 38
15. COMMENTS: NA = NOT AVAILABLE	

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ERT ANALYTICAL LABORATORY
ANALYTICAL RESULTS REPORT
CITY OF ST. LOUIS PARK, MN

ppt PAH ANALYSIS IN WATER

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
POLYAROMATIC HYDROCARBONS

FIELD ID: F-07

ERT NO.: 38841

CARCINOGENIC PAH'S

PARAMETERS	ANALYTICAL RESULT (NG/L)
QUINOLINE	4.5
BENZO (A) ANTHRACENE	< 4.4
CHRYSENE	< 4.4
BENZOFLUORANTHENES	ND
BENZO (A) PYRENE	ND
INDENO (1,2,3-CD) PYRENE	ND
DIBENZO (A,H) ANTHRACENE	ND
BENZO (G,H,I) PERYLENE	ND
TOTAL CARCINOGENIC PAH	4.5

OTHER PAH'S

2,3-BENZOFURAN	6.4
2,3-DIHYDROINDENE	580
INDENE	25
NAPHTHALENE	ND
BENZO (B) THIOPHENE	9.9
INDOLE	2
2-METHYLNAPHTHALENE	8
1-METHYLNAPHTHALENE	60
BIPHENYL	31
ACENAPHTHYLENE	28
ACENAPHTHENE	540
DIBENZOFURAN	310
FLOURENE	830
DIBENZOTHIOPHENE	98
PHENANTHRENE	ND
ANTHRACENE	91
ACRIDINE	19
CARBAZOLE	8.8
FLUORANTHENE	210
PYRENE	210
BENZO (E) PYRENE	ND
PERYLENE	ND
TOTAL OTHER PAH	3100
TOTAL PAH'S	3100

ND = Concentration < 95% Confidence Interval of MDL

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
POLYAROMATIC HYDROCARBONS

FIELD ID: T-08

ERT NO.: 38842

CARCINOGENIC PAH'S

PARAMETERS	ANALYTICAL RESULT (NG/L)
QUINOLINE	ND
BENZO (A) ANTHRACENE	ND
CHRYSENE	ND
BENZOFLUORANTHENES	ND
BENZO (A) PYRENE	ND
INDENO (1,2,3-CD) PYRENE	ND
DIBENZO (A,H) ANTHRACENE	ND
BENZO (G,H,I) PERYLENE	ND
TOTAL CARCINOGENIC PAH	ND

OTHER PAH'S

2,3-BENZOFURAN	ND
2,3-DIHYDROINDENE	ND
INDENE	ND
NAPHTHALENE	ND
BENZO (B) THIOPHENE	ND
INDOLE	ND
2-METHYLNAPHTHALENE	ND
1-METHYLNAPHTHALENE	ND
BIPHENYL	ND
ACENAPHTHYLENE	ND
ACENAPHTHENE	1.4
DIBENZOFURAN	< 1.2
FLOURENE	ND
DIBENZOTHIOPHENE	ND
PHENANTHRENE	ND
ANTHRACENE	ND
ACRIDINE	ND
CARBAZOLE	ND
FLUORANTHENE	ND
PYRENE	ND
BENZO (E) PYRENE	ND
PERYLENE	ND
TOTAL OTHER PAH	1.4
TOTAL PAH'S	1.4

ND = Concentration < 95% Confidence Interval of MDL

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
POLYAROMATIC HYDROCARBONS

FIELD ID: TD-08

ERT NO.: 38843

CARCINOGENIC PAH'S

PARAMETERS	ANALYTICAL RESULT (NG/L)
QUINOLINE	ND
BENZO (A) ANTHRACENE	ND
CHRYSENE	ND
BENZOFLUORANTHENES	ND
BENZO (A) PYRENE	ND
INDENO (1,2,3-CD) PYRENE	ND
DIBENZO (A,H) ANTHRACENE	ND
BENZO (G,H,I) PERYLENE	ND
TOTAL CARCINOGENIC PAH	ND

OTHER PAH'S

2,3-BENZOFURAN	ND
2,3-DIHYDROINDENE	< 3.4
INDENE	ND
NAPHTHALENE	ND
BENZO (B) THIOPHENE	ND
INDOLE	ND
2-METHYLNAPHTHALENE	ND
1-METHYLNAPHTHALENE	ND
BIPHENYL	ND
ACENAPHTHYLENE	ND
ACENAPHTHENE	1.9
DIBENZOFURAN	< 1.2
FLOURENE	ND
DIBENZOTHIOPHENE	ND
PHENANTHRENE	ND
ANTHRACENE	ND
ACRIDINE	ND
CARBAZOLE	ND
FLUORANTHENE	ND
PYRENE	ND
BENZO (E) PYRENE	ND
PERYLENE	ND
TOTAL OTHER PAH	1.9
TOTAL PAH'S	1.9

ND = Concentration < 95% Confidence Interval of MDL

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
POLYAROMATIC HYDROCARBONS

FIELD ID: TD-08A

ERT NO.: 38844

CARCINOGENIC PAH'S

PARAMETERS	ANALYTICAL RESULT (NG/L)
QUINOLINE	ND
BENZO (A) ANTHRACENE	ND
CHRYSENE	ND
BENZOFLUORANTHENES	ND
BENZO (A) PYRENE	ND
INDENO (1,2,3-CD) PYRENE	ND
DIBENZO (A,H) ANTHRACENE	ND
BENZO (G,H,I) PERYLENE	ND
TOTAL CARCINOGENIC PAH	ND

OTHER PAH'S

2,3-BENZOFURAN	ND
2,3-DIHYDROINDENE	< 3.4
INDENE	ND
NAPHTHALENE	ND
BENZO (B) THIOPHENE	ND
INDOLE	ND
2-METHYLNAPHTHALENE	ND
1-METHYLNAPHTHALENE	ND
BIPHENYL	ND
ACENAPHTHYLENE	ND
ACENAPHTHENE	< 1.3
DIBENZOFURAN	ND
FLOURENE	ND
DIBENZOTHIOPHENE	ND
PHENANTHRENE	37
ANTHRACENE	ND
ACRIDINE	ND
CARBAZOLE	ND
FLUORANTHENE	ND
PYRENE	ND
BENZO (E) PYRENE	ND
PERYLENE	ND
TOTAL OTHER PAH	37
TOTAL PAH'S	37

ND = Concentration < 95% Confidence Interval of MDL

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
POLYAROMATIC HYDROCARBONS

FIELD ID: MS-08

ERT NO.: 38845

CARCINOGENIC PAH'S

PARAMETERS	ANALYTICAL RESULT (NG/L)
QUINOLINE	7.8
BENZO (A) ANTHRACENE	ND
CHRYSENE	15
BENZOFUORANTHENES	ND
BENZO (A) PYRENE	ND
INDENO (1,2,3-CD) PYRENE	ND
DIBENZO (A,H) ANTHRACENE	ND
BENZO (G,H,I) PERYLENE	ND
TOTAL CARCINOGENIC PAH	23

OTHER PAH'S

2,3-BENZOFURAN	ND
2,3-DIHYDROINDENE	ND
INDENE	3.6
NAPHTHALENE	ND
BENZO (B) THIOPHENE	ND
INDOLE	ND
2-METHYLNAPHTHALENE	7
1-METHYLNAPHTHALENE	ND
BIPHENYL	ND
ACENAPHTHYLENE	ND
ACENAPHTHENE	< 1.3
DIBENZOFURAN	< 1.2
FLOURENE	12
DIBENZOTHIOPHENE	ND
PHENANTHRENE	4.5
ANTHRACENE	ND
ACRIDINE	ND
CARBAZOLE	ND
FLUORANTHENE	ND
PYRENE	ND
BENZO (E) PYRENE	7.6
PERYLENE	ND
TOTAL OTHER PAH	35
TOTAL PAH'S	58

ND = Concentration < 95% Confidence Interval of MDL

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
POLYAROMATIC HYDROCARBONS

FIELD ID: DI WATER BLANK

ERT NO.: 38846

CARCINOGENIC PAH'S

PARAMETERS	ANALYTICAL RESULT (NG/L)
QUINOLINE	ND
BENZO (A) ANTHRACENE	ND
CHRYSENE	ND
BENZOFLUORANTHENE	ND
BENZO (A) PYRENE	ND
INDENO (1,2,3-CD) PYRENE	ND
DIBENZO (A,H) ANTHRACENE	ND
BENZO (G,H,I) PERYLENE	ND
TOTAL CARCINOGENIC PAH	ND

OTHER PAH'S

2,3-BENZOFURAN	ND
2,3-DIHYDROINDENE	ND
INDENE	ND
NAPHTHALENE	ND
BENZO (B) THIOPHENE	ND
INDOLE	ND
2-METHYLNAPHTHALENE	ND
1-METHYLNAPHTHALENE	ND
BIPHENYL	ND
ACENAPHTHYLENE	ND
ACENAPHTHENE	1.7
DIBENZOFURAN	1.5
FLUORENE	< 1.1
DIBENZOTHIOPHENE	ND
PHENANTHRENE	ND
ANTHRACENE	ND
ACRIDINE	ND
CARBAZOLE	ND
FLUORANTHENE	< 4.4
PYRENE	ND
BENZO (E) PYRENE	ND
PERYLENE	ND
TOTAL OTHER PAH	3.2
TOTAL PAH'S	3.2

ND = Concentration < 95% Confidence Interval of MDL

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
POLYAROMATIC HYDROCARBONS

FIELD ID: MB860764

ERT NO.: 39044

CARCINOGENIC PAH'S

PARAMETERS	ANALYTICAL RESULT (NG/L)
QUINOLINE	ND
BENZO (A) ANTHRACENE	ND
CHRYSENE	ND
BENZOFLUORANTHENES	ND
BENZO (A) PYRENE	ND
INDENO (1,2,3-CD) PYRENE	ND
DIBENZO (A,H) ANTHRACENE	ND
BENZO (G,H,I) PERYLENE	ND
TOTAL CARCINOGENIC PAH	ND

OTHER PAH'S

2,3-BENZOFURAN	ND
2,3-DIHYDROINDENE	ND
INDENE	ND
NAPHTHALENE	ND
BENZO (B) THIOPHENE	ND
INDOLE	ND
2-METHYLNAPHTHALENE	ND
1-METHYLNAPHTHALENE	ND
BIPHENYL	ND
ACENAPHTHYLENE	ND
ACENAPHTHENE	ND
DIBENZOFURAN	< 1.2
FLOURENE	1.1
DIBENZOTHIOPHENE	ND
PHENANTHRENE	5.8
ANTHRACENE	ND
ACRIDINE	ND
CARBAZOLE	ND
FLUORANTHENE	ND
PYRENE	ND
BENZO (E) PYRENE	ND
PERYLENE	1.7
TOTAL OTHER PAH	8.6
TOTAL PAH'S	8.6

ND = Concentration < 95% Confidence Interval of MDL

ERT ANALYTICAL LABORATORY
METHOD SPIKE RECOVERY REPORT
CITY OF ST. LOUIS PARK, MN
ppt PAH ANALYSIS IN WATER

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
SURROGATE RECOVERY REPORT
POLYAROMATIC HYDROCARBONS

FIELD ID: MS-08

ERT NO.: 38845

<u>PARAMETERS</u>	<u>SPIKE LEVEL(NG/L)</u>	<u>OBS. LEVEL(NG/L)</u>	<u>% RECOVERY</u>
NAPHTHALENE	110	28	25
FLUORENE	21	13	62
CHRYSENE	24	15	63
BENZO (G,H,I) PERYLENE	22	3.0	14
INDENE	25	3.6	14
QUINOLINE	24	7.8	33
BENZO (E) PYRENE	20	7.6	38
2-METHYLNAPHTHALENE	21	7.0	33
			=====
AVERAGE % RECOVERY			35

AVERAGE % RECOVERY TARGET RANGE = 20% - 150%

ERT ANALYTICAL LABORATORY
SURROGATE RECOVERY REPORT
CITY OF ST. LOUIS PARK, MN

ppt PAH ANALYSIS IN WATER

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
SURROGATE RECOVERY REPORT
POLYAROMATIC HYDROCARBONS

FIELD ID: F-08

ERT NO.: 38841

SURROGATE	SPIKE LEVEL (NG/L)	% RECOVERY	95% CONFIDENCE LIMITS (%)
NAPHTHALENE - D8	9.9	129	42-102
FLUORENE - D10	9.5	132	60-128
CHRYSENE - D12	9.8	52	10-54

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
SURROGATE RECOVERY REPORT
POLYAROMATIC HYDROCARBONS

FIELD ID: T-08

ERT NO : 38842

SURROGATE	SPIKE LEVEL (NG/L)	% RECOVERY	95% CONFIDENCE LIMITS (%)
NAPHTHALENE - D8	9.9	117	42-102
FLUORENE - D10	9.5	79	60-128
CHRYSENE - D12	9.8	45	10-54

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
SURROGATE RECOVERY REPORT
POLYAROMATIC HYDROCARBONS

FIELD ID: TD-08

ERT NO.: 38843

SURROGATE	SPIKE LEVEL (NG/L)	% RECOVERY	95% CONFIDENCE LIMITS (%)
NAPHTHALENE - D8	9.9	78	42-102
FLUORENE - D10	9.5	77	60-128
CHRYSENE - D12	9.8	48	10-54

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
SURROGATE RECOVERY REPORT
POLYAROMATIC HYDROCARBONS

FIELD ID: TD-08A

ERT NO.: 38844

SURROGATE	SPIKE LEVEL (NG/L)	% RECOVERY	95% CONFIDENCE LIMITS (%)
NAPHTHALENE - D8	9.9	70	42-102
FLUORENE - D10	9.5	64	60-128
CHRYSENE - D12	9.8	26	10-54

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
SURROGATE RECOVERY REPORT
POLYAROMATIC HYDROCARBONS

FIELD ID: DI H2O BLANK

ERT NO.: 38846

SURROGATE	SPIKE LEVEL (NG/L)	% RECOVERY	95% CONFIDENCE LIMITS (%)
NAPHTHALENE - D8	9.9	79	42-102
FLUORENE - D10	9.5	82	60-128
CHRYSENE - D12	9.8	60	10-54

ERT ANALYTICAL LABORATORY
SUMMARY OF ANALYTICAL RESULTS
SURROGATE RECOVERY REPORT
POLYAROMATIC HYDROCARBONS

FIELD ID: MS-08

ERT NO.: 38845

SURROGATE	SPIKE LEVEL (NG/L)	% RECOVERY	95% CONFIDENCE LIMITS (%)
NAPHTHALENE - D8	9.9	52	42-102
FLUORENE - D10	9.5	65	60-128
CHRYSENE - D12	9.8	62	10-54

ERT ANALYTICAL LABORATORY
METHOD DETECTION LIMITS
CITY OF ST. LOUIS PARK, MN

ppt PAH ANALYSIS IN WATER

ERT ANALYTICAL LABORATORY
PPT ANALYSIS OF PAH in WATER
METHOD DETECTION LIMITS

CARCINOGENIC PAH'S

PARAMETERS	MDL	0.64 MDL
QUINOLINE	1.90	1.20
BENZO (A) ANTHRACENE	4.40	2.80
CHRYSENE	4.40	2.80
BENZOFLUORANTHENE	9.70	6.20
BENZO (A) PYRENE	3.40	2.20
INDENO (1,2,3-CD) PYRENE	4.40	2.80
DIBENZO (A,H) ANTHRACENE	3.40	2.20
DIBENZO (G,H,I) PERYLENE	5.30	3.40

PARAMETERS	OTHER PAH'S	MDL	0.64 MDL
2,3-BENZOFURAN		1.90	1.20
2,3-DIHYDROINDENE		3.40	2.20
INDENE		2.90	1.80
NAPHTHALENE		47.00	30.00
BENZO (B) THIOPHENE		2.20	1.40
INDOLE		1.90	1.20
2-METHYLNAPHTHALENE		5.00	3.20
1-METHYLNAPHTHALENE		3.10	2.00
BIPHENYL		17.00	11.00
ACENAPHTHYLENE		1.70	1.10
ACENAPHTHENE		1.30	0.83
DIBENZOFURAN		1.20	0.77
FLOURENE		0.88	0.56
DIBENZOTHIOPHENE		6.30	4.00
PHENANTHRENE		3.10	2.00
ANTHRACENE		3.40	2.20
ACRIDINE		2.50	1.60
CARBAZOLE		2.60	1.70
FLUORANTHENE		4.40	2.80
PYRENE		4.10	2.60
BENZO (E) PYRENE		1.50	0.96
PERYLENE		1.60	1.00

0.64 MDL = LOWER CONTROL LIMIT OF 95% CONFIDENCE INTERVAL OF MDL

CHAIN OF CUSTODY RECORD

mem 10/4

Client/Project Name City of St Louis Park			Project Location St Louis Park MN			ANALYSES					
Project No.			Field Logbook No.						<div style="writing-mode: vertical-rl; transform: rotate(180deg);">PPT PAH</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">ERT#</div>		
Sampler (Signature) <i>Ronald Serrano</i>			Chain of Custody Tape No. 10-2651 102649-102650 102652								
Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							
7-08	10-7-86	11:15 ^{AM}	38935	4X1L Amber	X						38841
T-08	10-7-86	11:25	38939	4X1L Amber	X						38842
TD-08	10-7-86	11:35	38940	4X1L Amber	X						38843
TD-08A	10-7-86	11:45	38941	4X1L Amber	X						38844
MS-08	10-7-86	11:55	38942	3X1L Amber	X						38845
DI H ₂ O	10/6/86		38943	4X1L Amber	X						38846
Relinquished by: (Signature) <i>Ronald Serrano</i>					Date 10-7-86	Time 12:50 PM	Received by: (Signature)			Date	Time
Relinquished by: (Signature)					Date	Time	Received by: (Signature)			Date	Time
Relinquished by: (Signature)					Date	Time	Received for Laboratory: (Signature) <i>Michael Fry</i>			Date 10/2/86	Time 09:30
Sample Disposal Method:					Disposed of by: (Signature)					Date	Time
SAMPLE COLLECTOR Environmental Research and Technology, Inc. 696 Virginia Road Concord, MA 01742 617-369-8910					ANALYTICAL LABORATORY Robert Burke City of St Louis Park (water Dept) 5005 Mtka. Blvd. ST Louis Park MN. 55416					ERT No 5636	

SAMPLE RECEIPT CHECK LIST

Client: *City of St Louis Park, MN* *D209-143*

COC Record #(s): *5636*

Matrix	Container	ERT #(s)
<i>Water PAH ppt</i>	<i>4 X 12. Amber</i>	<i>38841-38846</i>

1. Were samples shipped or hand-delivered? *Shipped*

Notes: *Airbill # 302513632*

2. Was COC record present upon receipt of samples?

Yes ☒ No ☐

Notes:

3. Was COC tape present/unbroken on outer package?

Yes ☒ No ☐

Notes: *102649, 102650*

4. Were samples received ambient or chilled? *Ambient*

Notes: *No Evidence of ICE*

5. Were any samples received broken/leaking (improperly sealed)?

Yes ☐ No ☒

Notes:

6. Were samples properly preserved?

Yes ☐ No ☒

Notes: *Should have been Cool*

7. Were COC types present/unbroken on samples?

Yes ☐ No ☒

Notes:

8. Any discrepancies between sample labels and COC records?

Yes ☒ No ☐

Notes: *COC Record indicates Tape # 102649, 102650*

9. Were samples received within holding times?

Yes ☒ No ☐

Notes:

Additional Comments:

Stored in cooler in eq. in Room *Replacements of samples rec'd 10/3/86*
38845 Rec'd 3 X 12. Amber

Samples inspected and logged in by *Michael P. Ryan* Date: *10/8/86*